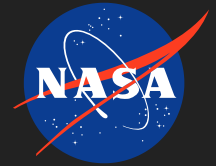


Regenerable Sorbent for Combined CO₂, Water, and Trace-Contaminant Capture in the Primary Life Support System (PLSS),

Phase I

Completed Technology Project (2013 - 2013)



Project Introduction

The NASA objective of expanding the human experience into the far reaches of space requires the development of regenerable life support systems. This proposal addresses the development of an integrated air-revitalization system for the space suit used in Extravehicular Activities (EVAs). The proposed innovations are: (1) a single CO₂, H₂O, and trace-contaminant management unit; (2) a single sorbent possessing the capability to remove CO₂, H₂O, and trace contaminants; (3) monolithic sorption unit to provide the following functions: (a) CO₂ sorbent; (b) H₂O sorbent; (c) trace-contaminants sorbent; (d) low pressure drop; (e) good thermal management (heat transfer and low heat of adsorption); (f) resistance to dusty environments; and (4) regenerable operation. The overall objective is to develop a CO₂/H₂O/trace-contaminant removal system that is regenerable and that possesses weight, size, and power-requirement advantages over the current state of the art. The Phase 1 objectives are: (1) to demonstrate the technical feasibility of using a novel CO₂ sorbent; and (2) to demonstrate effective CO₂, H₂O, and ammonia sorption and regeneration. This will be accomplished in three tasks: (1) Sorbent Preparation and Characterization; (2) Sorbent Testing; and (3) Product Assessment.

Primary U.S. Work Locations and Key Partners

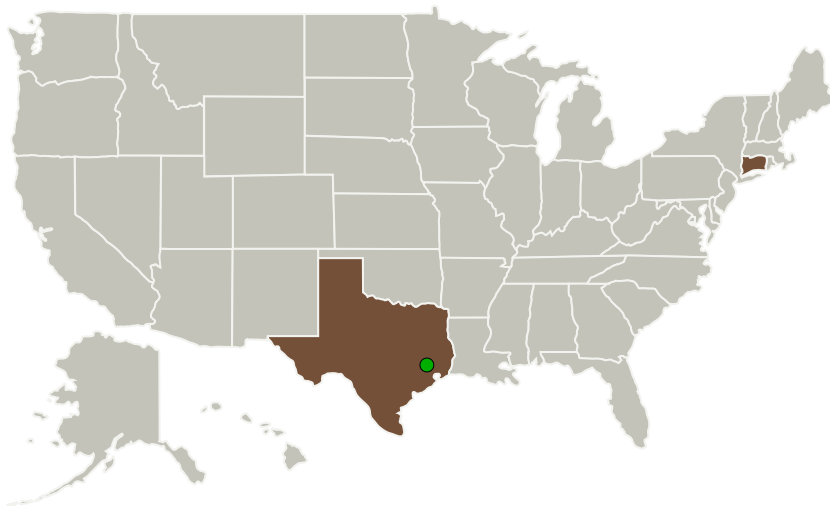


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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Advanced Fuel Research, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

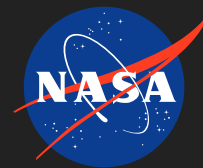
Carlos Torrez

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Regenerable Sorbent for Combined CO₂, Water, and Trace-Contaminant Capture in the Primary Life Support System (PLSS),

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Organizations Performing Work	Role	Type	Location
Advanced Fuel Research, Inc.	Lead Organization	Industry	East Hartford, Connecticut
● Johnson Space Center(JSC)	Supporting Organization	NASA Center	Houston, Texas

Primary U.S. Work Locations	
Connecticut	Texas

Project Transitions

**May 2013:** Project Start**November 2013:** Closed out

Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/140402>)

Images

Project Image

Regenerable Sorbent for Combined CO₂, Water, and Trace-Contaminant Capture in the Primary Life Support System (PLSS)
(<https://techport.nasa.gov/image/127106>)

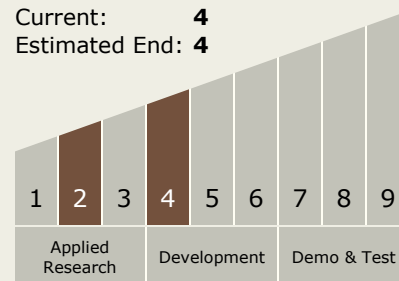
Project Management (cont.)

Principal Investigator:

Marek Wojtowicz

Technology Maturity (TRL)

Start: 2
Current: 4
Estimated End: 4



Technology Areas

Primary:

- TX06 Human Health, Life Support, and Habitation Systems
 - TX06.2 Extravehicular Activity Systems
 - TX06.2.2 Portable Life Support System

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System